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A1M MDC

(56) Documents Cited
US 5433029 A US 5253444 A US 3282000 A

(58) Field of Search
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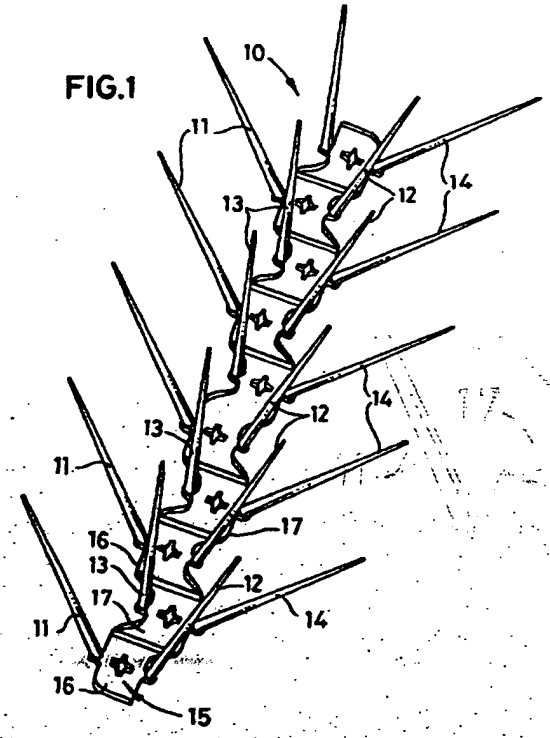
(54) Abstract Title
Bird deterrent device

(57) A bird deterrent device comprising a base element of plastics material moulded integrally with a plurality of plastics material prongs extending at at least four different angles to the base element. The base element is to be secured in use to a surface to be protected and the plurality of prongs may extend from the base element as a sequence of laterally staggered first and second pairs of mutually diverging prongs located in planes that are spaced apart in a direction transverse to the planes. The base element together with the first pairs of prongs and the second pairs of prongs are all moulded integrally with one another of plastics material.

The device may be secured with adhesive to the surface to be protected and apertures in the base assist the adhesion. The base may have transverse lines of weakness along which required lengths of deterrent may be snapped off.

FIG.1



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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date but within the period prescribed by Rule 25(1) of the Patents Rules 1995.

FIG.1

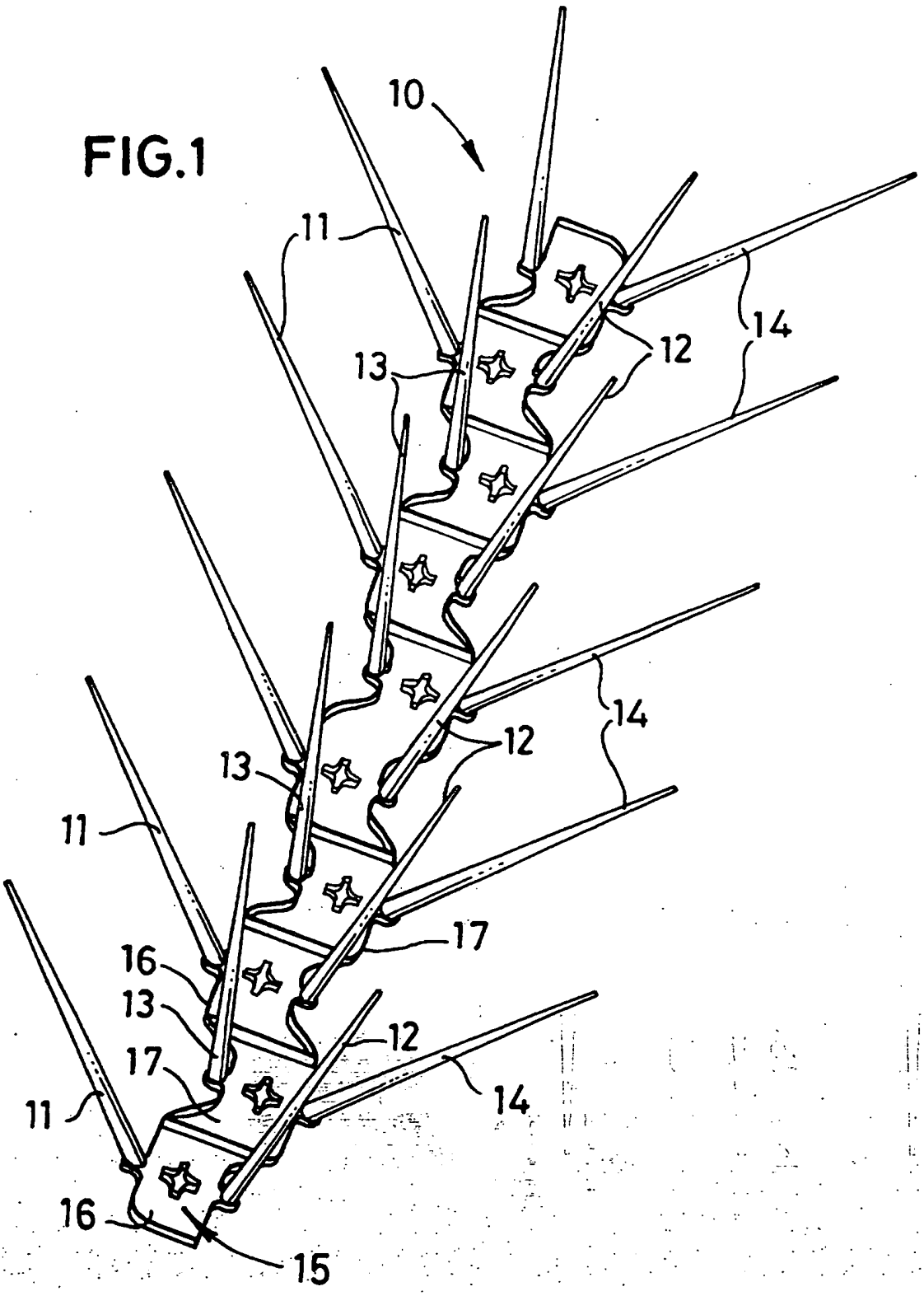


FIG.3

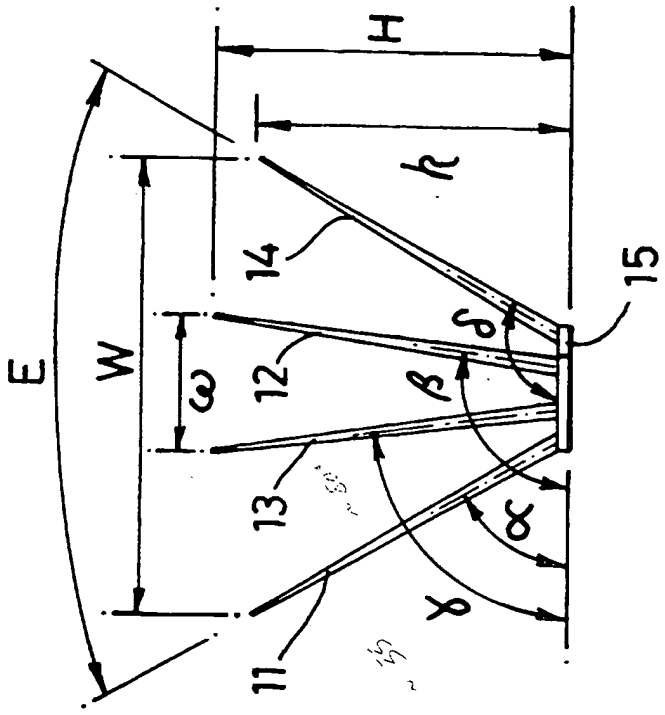
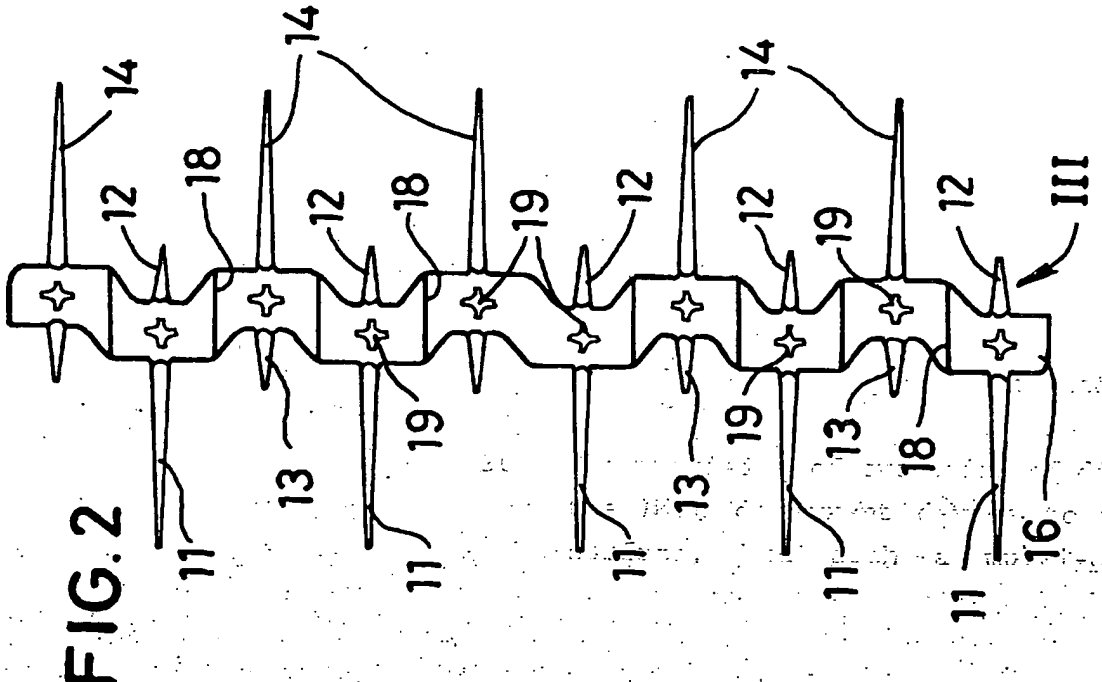


FIG.2



BIRD DETERRING DEVICES

DESCRIPTION

Technical Field

This invention relates to devices for deterring birds, especially pigeons, from landing or alighting on surfaces. Such bird deterrent devices thus serve to protect the surfaces against bird faeces and their damaging effect.

Background Art

Known bird deterrent devices (for example as disclosed in EP-0300441, EP-0300936, EP-0340108, EP-0515262 and EP-0792099) comprise a base element to be secured to the surface to be protected, and a plurality of mutually spaced prongs extending from the base element. In EP-0792099, the base element is provided as an elongate strip of plastics material with the prongs provided as metal wire tines formed by the diverging limbs of symmetric, truncated-V formations attached to the plastic strip. The metal tines are arranged as a laterally staggered sequence of first and second pairs of mutually diverging prongs located in parallel planes that, when viewed in a direction normal to the planes, present the inward metal prong of each first pair in a crossing-over or overlapping relation with the inward metal prong of each second pair.

The provision of two pairs of divergent metal prongs enable the bird deterrent device to protect a wider stretch of surface, but such a multi-part construction is time consuming to assemble and hence more expensive than necessary. It has heretofore been impossible economically to produce such a bird deterrent device, having four prongs across the device width, wholly of plastics material.

According to this invention there is provided a bird deterrent device comprising a base element of plastics material molded integrally with a plurality of plastics material prongs extending at at least four different angles to the base element.

According to another aspect of the present invention there is provided a bird deterrent device comprising a base element to be secured in use to a surface to be protected and a plurality of prongs extending from the base element and arranged as a sequence of laterally staggered first and second pairs of mutually diverging prongs located in planes that are spaced apart in a direction transverse to the planes, characterised in that the base element together with the first pairs of prongs and the second pairs of prongs are all molded integrally with one another of plastics material.

Advantageously the two prongs of each first pair are angled asymmetrically to one another; and the two prongs of each second pair are angled asymmetrically to one another. Preferably, in this case, the first and second pairs are mirror-images of one another across a central plane extending longitudinally of the base element.

Advantageously the lateral staggering of the first and second pairs of prongs is such that, when viewed in the said direction, the two inner prongs (i.e. one from a first pair and one from a second pair) are angled to one another such as to diverge from one another without mutually overlapping, i.e. without crossing over one another. This assists in nesting of one such bird deterrent device within another for storage and/or packing and/or transportation.

Preferably said base element is of generally strip-like form with the other prong of each first pair extending

laterally beyond one side of the strip-like base element and with the other prong of each second pair extending laterally beyond the opposite side of the strip-like base element.

Advantageously the strip-like base element is provided at spaced apart intervals, preferably on its underside, with lines of weakness, e.g. provided by transverse grooves of preferably V-shaped cross-section, to allow a desired length to be snapped off the strip-like base element.

Preferably the strip-like base element has a sinuous form.

Advantageously the prongs extend upwards from side projections extending laterally from the main path of the strip-like base element. Preferably these projections correspond dimensionally to the width of the base (or root portion) of the prongs. This likewise assists in nesting of one such bird deterrent device within another for storage and/or packing and/or transportation.

Advantageously the base element is provided with countersunk apertures, preferably of non-circular (e.g. cruciform) shape. When the base element is to be secured by adhesive to a surface to be protected, the adhesive can be squeezed out from beneath the base element and enter the countersunk apertures such as to form therewith a keying bond when the adhesive is set.

Brief Description of the Drawings

By way of example one embodiment of this invention will now be described with reference to the accompanying drawings of which:

Figure 1 is a perspective view of a bird deterrent device according to this invention,

Figure 2 is an underneath plan view of the bird deterrent device of Fig 1, and

Figure 3 is an end view in the direction of arrow III of Fig 2.

The illustrated bird deterrent device 10 is a one-piece of molding of plastics material. It comprises a generally flat strip 15 and a plurality of tapering prongs 11-14 extending upwards from it. The wider base or root of each of the prongs 11-14 is provided by a projection (of comparable width to the prong root) that extends laterally from the main path of the strip 15. The latter is of somewhat sinuous form having sections 16,17 laterally staggered with respect to one another. Each section 16 has a pair of tapering prongs 11,12 molded therewith to extend in a common plane directed at right angles to that section's generally longitudinal direction and at angles of respectively α and β to the horizontal. In this example the angles α and β are of the order of 82° and 120° respectively. Each section 17 has a pair of tapering prongs 13,14 molded therewith to extend in a common plane directed at right-angles to that section's generally longitudinal direction and at angles of γ and δ respectively to the horizontal. In this example the angles γ and δ are of the order of 60° and 108° respectively.

Thus the two prongs 11,12 are angled asymmetrically to one another, and two prongs 13,14 are likewise angled asymmetrically to one another but are mirror-image formations of the two prongs 11,12 and offset laterally from them.

The staggered relation of sections 16,17 is such that even at the level of the base strip 15 (see Fig 3), the inner prongs 12,13 are located wholly within the arcuate zone ϵ (in this example of the order of 60°) defined by the outer

prongs 11,14 and there is no "crossing over" of the inner prongs 12,13 that define an inward arcuate zone having an angle of $\beta - \gamma$ (in this example of the order of 36°). This arrangement permits the bird deterrent device 10 to be readily molded as a unitary article with the strip 15 and all the prongs 11-14 integral with one another. Also, due to the roots of the prongs 11-14 being provided by comparably-sized extensions projecting laterally outwardly of the main path of strip 15, the arrangement permits nesting of one such bird deterrent device upon (or within) another for storage and/or packing and/or transportation.

In this illustrated example, the length of the prongs 11-14 is such that, the spacing W between the tips of the outward prongs 11,14 is of the order of 145mm and the spacing w between the tips of the inward prongs 12,13 is of the order of 45mm; the height h of the outward prongs 11,14 above strip 15 is of the order of 99mm, and the height H of the inward prongs 12,13 above strip 15 is of the order of 112mm. Also, in this illustrated example, the spacing between a plane containing one pair of prongs (e.g. prongs 11,12) and the next adjacent plane containing another pair of prongs (e.g. prongs 13,14) is of the order of 33mm.

The sections 16,17 of strip 15 are divided from one another by transverse lines of weakness 18 provided by transverse grooves or channels of V-shaped cross-section. For example, where the strip 15 has a thickness of, say, 3 to 3.5mm, the depth of each groove or channel 18 may be in the range of 1 to 1.5mm. These lines of weakness 18 allow a desired length of the strip to be snapped off from a longer manufactured length which, in this example, may be of the order of 325 to 330mm. In the preferred example illustrated (and as shown in Fig 2) the transverse grooves or channels 18 are provided in the underneath surface of the strip-like base element 15.

In addition, at intervals along the strip 15, e.g. within each of sections 16 and 17, the strip may be provided with "countersunk" apertures 19 of cruciform shape, the size of each aperture 19 being greater on the strip's top surface than on the strip's bottom surface. In this illustrated example, the angle of the countersinking is 80° and where the strip is of 3mm thickness, provides a maximum aperture width of about 10mm on the strip's top surface and about 9mm on the strip's underneath surface.

When the bird deterrent device 10 is to be installed or mounted on a surface to be protected, a line of adhesive is squeezed out from a tube or otherwise extruded from an adhesive applicator as a ribbon or band upon the surface to be protected and/or upon the underneath face of the strip 15 (or a piece snapped off from it). The latter is then placed on the surface – or the adhesive line thereon – and pressed down firmly. As a result adhesive is spread out below the strip 15, into any channels or grooves 18 present and also upwards through the countersunk apertures 19. When the adhesive sets, the adhesive portions within any grooves or channels 18 present, and within the countersunk apertures 19 form therewith a key. That key, at least with the apertures 19 (that are of cruciform shape), resists rotation around each aperture (as can occur with circular holes) and also, due to the apertures' countersunk form, physically resists lifting of the strip 15 from off the surface.

Preferably, at each end of the bird deterrent device, an end one of the prongs 11-14 has a line of weakness provided, e.g. by a groove or channel, between its root and the main path of the strip-like base element 15. This line of weakness allows such an end prong to be readily broken off by an installer so as to assist in fitting the strip onto a surface close up to the arris between that surface

prongs 11,14 and there is no "crossing over" of the inner prongs 12,13 that define an inward arcuate zone having an angle of $\beta - \gamma$ (in this example of the order of 36°). This arrangement permits the bird deterrent device 10 to be readily molded as a unitary article with the strip 15 and all the prongs 11-14 integral with one another. Also, due to the roots of the prongs 11-14 being provided by comparably-sized extensions projecting laterally outwardly of the main path of strip 15, the arrangement permits nesting of one such bird deterrent device upon (or within) another for storage and/or packing and/or transportation.

In this illustrated example, the length of the prongs 11-14 is such that, the spacing ***W*** between the tips of the outward prongs 11,14 is of the order of 145mm and the spacing ***w*** between the tips of the inward prongs 12,13 is of the order of 45mm; the height ***h*** of the outward prongs 11,14 above strip 15 is of the order of 99mm, and the height ***H*** of the inward prongs 12,13 above strip 15 is of the order of 112mm. Also, in this illustrated example, the spacing between a plane containing one pair of prongs (e.g. prongs 11,12) and the next adjacent plane containing another pair of prongs (e.g. prongs 13,14) is of the order of 33mm.

The sections 16,17 of strip 15 are divided from one another by transverse lines of weakness 18 provided by transverse grooves or channels of V-shaped cross-section. For example, where the strip 15 has a thickness of, say, 3 to 3.5mm, the depth of each groove or channel 18 may be in the range of 1 to 1.5mm. These lines of weakness 18 allow a desired length of the strip to be snapped off from a longer manufactured length which, in this example, may be of the order of 325 to 330mm. In the preferred example illustrated (and as shown in Fig 2) the transverse grooves or channels 18 are provided in the underneath surface of the strip-like base element 15.

CLAIMS

1. A bird deterrent device comprising a base element of plastics material molded integrally with a plurality of plastics material prongs extending at at least four different angles to the base element.

2. A bird deterrent device comprising a base element to be secured in use to a surface to be protected and a plurality of prongs extending from the base element and arranged as a sequence of laterally staggered first and second pairs of mutually diverging prongs located in planes that are spaced apart in a direction transverse to the planes, **characterised in that** the base element together with the first pairs of prongs and the second pairs of prongs are all molded integrally with one another of plastics material.

3. A bird deterrent device according to Claim 2 wherein the two prongs of each first pair are angled asymmetrically to one another; and the two prongs of each second pair are angled asymmetrically to one another.

4. A bird deterrent device according to Claim 3, wherein the first and second pairs are mirror-images of one another across a central plane extending longitudinally of the base element.

5. A bird deterrent device according to any one of Claims 2 to 4, wherein the lateral staggering of the first and second pairs of prongs is such that, when viewed in the said direction, the two inner prongs — i.e. one from a first pair and one from a second pair — are angled to one another such as to diverge from one another without mutually overlapping, i.e. without crossing over one another.

6. A bird deterrent device according to any one of Claims 2 to 5, wherein said base element is of generally strip-like form with the other prong of each first pair extending laterally beyond one side of the strip-like base element and with the other prong of each second pair extending laterally beyond the opposite side of the strip-like base element.

7. A bird deterrent device according to any one of Claims 1 to 6, wherein the strip-like base element is provided at spaced apart intervals with lines of weakness to allow a desired length to be snapped off the strip-like base element.

8. A bird deterrent device according to Claim 7, wherein said lines of weakness are provided on the underside of the strip-like base element.

9. A bird deterrent device according to Claim 7 or Claim 8, wherein said lines of weakness are provided by transverse grooves of preferably V-shaped cross-section across the strip-like base element.

10. A bird deterrent device according to any one of Claims 1 to 9, wherein the strip-like base element has a sinuous form.

11. A bird deterrent device according to any one of Claims 1 to 9, wherein the prongs extend upwards from side projections that extend laterally from the main path of the strip-like base element.

12. A bird deterrent device according to Claim 11, wherein the sAID projections correspond dimensionally to the width of the base or root portion of the prongs.

13. A bird deterrent device according to any one of Claims 1 to 12, wherein the base element is provided with countersunk apertures to assist in securing the base element by adhesive to a surface that is to be protected.

14. A bird deterrent device according to Claim 13, wherein said countersunk apertures are of non-circular shape.

15. A bird deterrent device according to Claim 13 or Claim 14, wherein said countersunk apertures are of cruciform shape.

16. A bird deterrent device substantially as herein described with reference to and/or as illustrated in the accompanying drawings.

The Patent Office

INVESTOR IN PEOPLE

Application No: GB 9826660.4 **Examiner:** Rhys Williams
Claims searched: 1 and 7-15 **Date of search:** 13 March 2000

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): A1M (MDC)

Int Cl (Ed.7): A01M (29/00) E04B (1/62, 1/92) E04D (13/00)

Other: On-line: (WPI, EPODOC, PAJ)

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	US 5433029	(DONOHO) See the figures and column 2 line 67 - column 3 line 2.	1
X	US 5253444	(DONOHO) See the figures and column 4 lines 16-19.	1
X	US 3282000	(SHAW) See the figures and column 5 line 73 - column 6 line 2.	1

X Document indicating lack of novelty or inventive step
Y Document indicating lack of inventive step if combined with one or more other documents of same category.
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